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E2F FAE FAG F110 F116
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(56) Documents cited

GB 2162891 A	GB 2162890 A	GB 2159575 A
GB 2159574 A	GB 1535453 A	US 4685735 A

(58) Field of search
UK CL (Edition L) E2F FAE FAG
INT CL^5 B60N, E05D

(54) Seat reclining mechanism

(57) A seat reclining mechanism including first and second members 51, 52 pivotally connected to one another and a gear transmission 55 drivingly connected to the first and second members 51, 52, the gear transmission 55 including an input shaft which, on rotation in one direction, causes the first and second members 51, 52 to move angularly apart in a reclining direction and biasing means 60 operably connected to the first and second members to provide a biasing force opposing movement of the first and second members in the reclining direction. The biasing means 60 may be in to form of a torsion spring 61 connected between first and second members 51, 52 or it may be connected between a seat back and a seat cushion to which the first and second members 51, 52 are mounted.

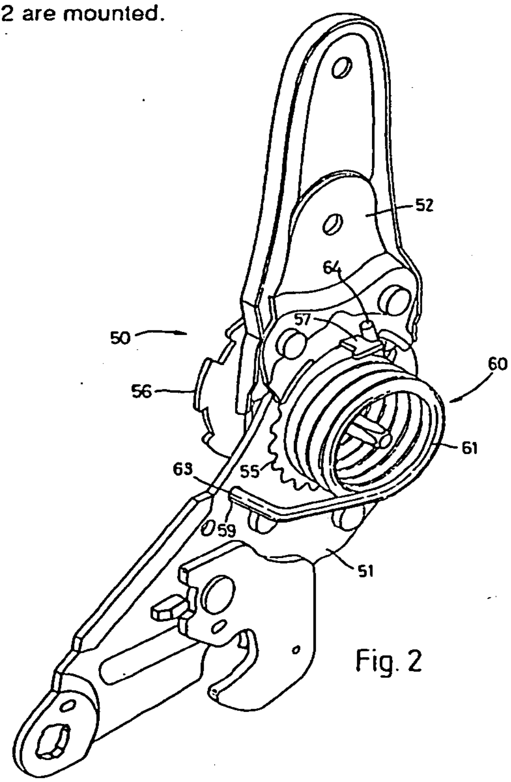

Fig. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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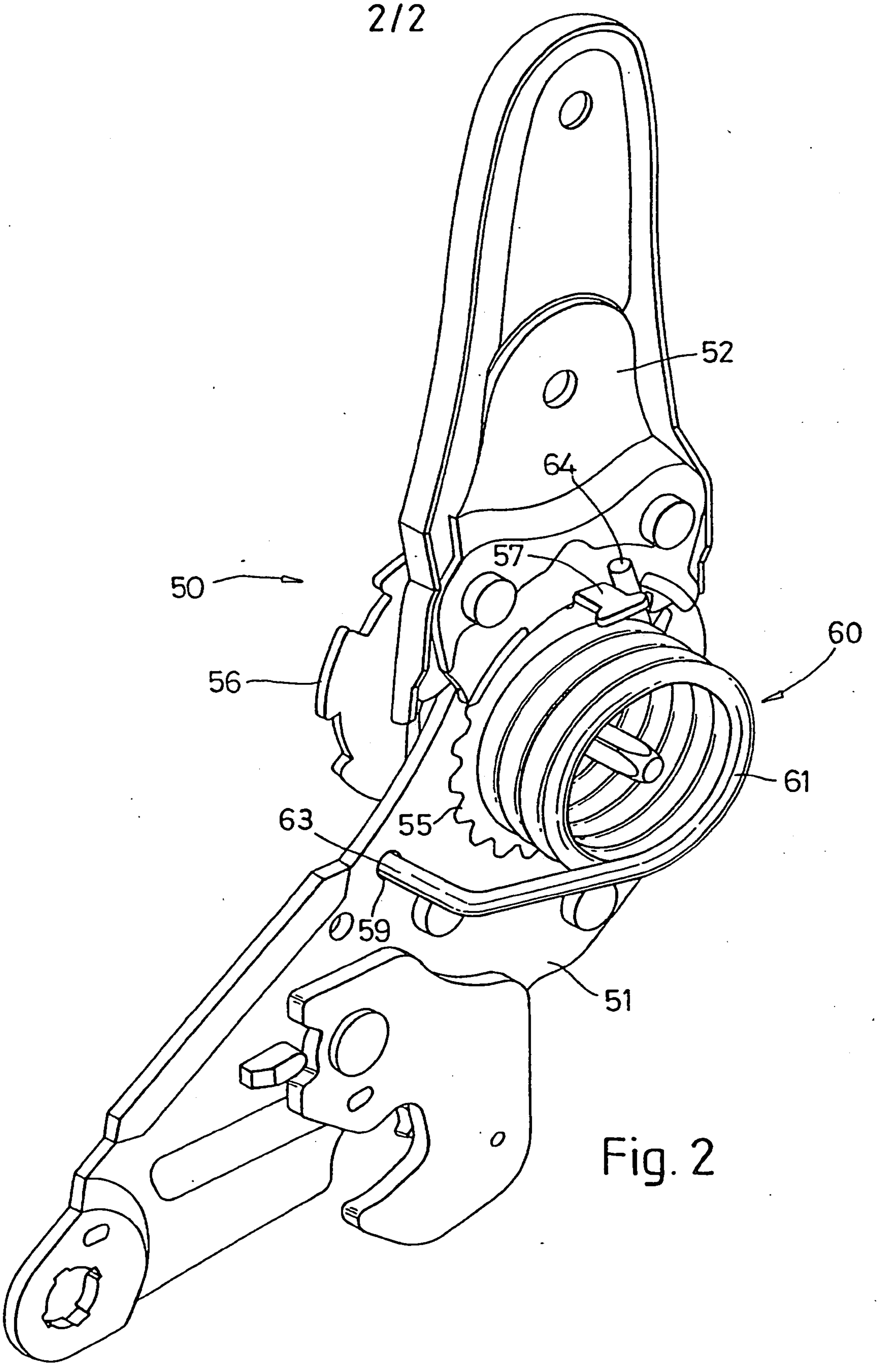

Fig. 2

and second members to provide a biasing force opposing movement of the first and second members in the reclining direction.

According to another aspect of the present invention there is provided a seat, preferably a vehicle seat, having a seat cushion pivotally connected to a seat back by a seat reclining mechanism including first and second members pivotally connected to one another and a gear transmission drivingly connected to the first and second members, the first member being connected to the seat cushion and the second member being connected to the seat back, the gear transmission including an input shaft which on rotation in one direction causes the first and second members to move angularly apart in a reclining direction to cause the seat back to move in said reclining direction relative to the seat squab and biasing means arranged to provide a biasing force opposing movement of the seat back in said reclining direction.

Preferably, the biasing means is arranged to progressively increase biasing force in relation to an increase in the angular displacement between the first and second members in the recline direction.

The seat back is arranged to move between a fully upright position to a fully reclined position and the biasing means is arranged to provide a biasing force which is preferably about 50 to 100%, more preferably about 75 to 90% of the gravitational biasing force created by the weight of the seat back at any position between said fully

If the seat reclining mechanism is operated to move the seat back 14 toward its fully reclined position vibration in the reclining mechanism occurs and if this vibration occurs at the natural frequency of the seat back, the seat back resonates causing it to judder.

In accordance with the present invention a biasing means is provided which provides a biasing force to oppose the movement of the seat back 14 toward the fully reclined position FP such that the vibration caused on such movement is maintained outside the natural frequency range of the seat back and therefore prevents the seat back from resonating.

The biasing means, which may be a torsion or tension spring, may be directly connected between the seat cushion 12 and seat back 14 and/or may be incorporated in the seat reclining mechanism.

Preferably the biasing force created by the biasing means progressively increases as the seat back 14 moves progressively closer to the fully reclined position FP in order to compensate for the progressive increase in gravitational bias created by the weight of the seat back. The biasing means is preferably arranged to create a biasing force which is equal to or less than the gravitational biasing force created by the weight of the seat back 14 at any position between positions FU and FR. In this way the weight of the seat back will always ensure that the seat back 14 is in position IP and not PP (or a position intermediate IP and PP). Preferably the biasing

CLAIMS

1. A seat reclining mechanism including first and second members pivotally connected to one another and a gear transmission drivingly connected to the first and second members, the gear transmission including an input shaft which, on rotation in one direction, causes the first and second members to move angularly apart in a reclining direction and biasing means operably connected to the first and second members to provide a biasing force opposing movement of the first and second members in the reclining direction.

2. A seat reclining mechanism according to claim 1, wherein the biasing means is arranged to progressively increase the biasing force in relation to an increase in the angular displacement between the first and second members in the recline direction.

3. A seat reclining mechanism according to claim 1 or 2, wherein the biasing means is a torsion spring.

4. A seat reclining mechanism according to claim 3, wherein the biasing means in a tension spring.

5. A seat reclining mechanism according to claim 3, wherein the torsion spring comprises a coiled spring having one end anchored to the first member and an opposite end anchored to the second member.

6. A seat having a seat cushion pivotally connected to a seat back by a seat reclining mechanism according to any preceding claim.

7. A seat having a seat cushion pivotally connected to a seat back by a seat reclining mechanism including first and second members pivotally connected to one another and a gear transmission drivingly connected to the first and second members, the first member being connected to the seat cushion and the second member being connected to the seat back, the gear transmission including an input shaft which on rotation in one direction causes the first and second members to move angularly apart in a reclining direction to cause the seat back to move in said reclining

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

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Relevant Technical fields

(i) UK Cl (Edition L) E2F (FAE,FAG)

(ii) Int Cl (Edition 5) B60N, E05D

Search Examiner

S J CHURCH

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

30 MARCH 1993

Documents considered relevant following a search in respect of claims 1-10

Category (see over)	Identity of document and relevant passages			Relevant to claim(s)
X	GB 2162891	A	(KAISHA) see balancing spring 29	1-4, 6 and 7
X	GB 2162890	A	(KAISHA) see balancing spring 31	1-4, 6 and 7
X	GB 2159575	A	(KAISHA) see spiral spring 28	1-4, 6 and 7
X	GB 2159574	A	(KAISHA) see especially page 3 lines 67-71	1-4, 6 and 7
X	GB 1535453		(DAIMLER-BENZ) see especially page 2 lines 115-123	
X	US 4685735		(McFALLS) see spring 62	1-7